

Date: September 29, 2009

Title: Dimensional Analysis

Objective: Apply proportions to the "real world".

IN:

How long is Mr. Basile's foot in inches if it is 28.2 centimeters?

Dimensional Analysis!

How many seconds are in one year?



Dimensional Analysis!

1 mile = 1760 yds	16 oz = 1 lb	1 L = 1.06 qts	1 day = 24 hours
1 yd = 3 ft	2000 lbs = 1 ton	4 qts = 1 gal	1 hour = 60 mins
1 ft = 12 in	1 oz = 28.35 g	32 oz = 1 qt	1 min = 60 secs
1 mile = 1.61 km	1 kg = 2.2 lbs	1 qt = 2 pts	

Mr. Basile went out for a 5-mile jog this morning. How many yards did he run?

Dimensional Analysis!

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In the Tour de France, cyclists ride 3, 653.6 km over 20 days. How many feet do they go? Hint! There is some unimportant information in this problem!



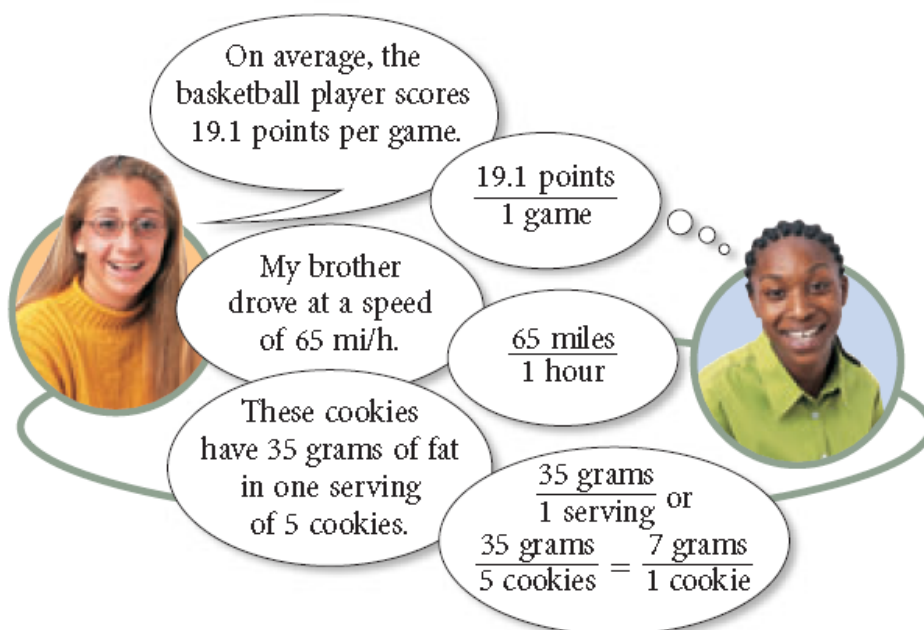
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Dimensional Analysis!

APPLICATION Recipes in many international cookbooks use metric measurements. One cookie recipe calls for 120 milliliters of sugar. How much is this in our customary unit “cups”? (There are 1000 milliliters in a liter, 1.06 quarts in a liter, and 4 cups in a quart.)



Unit Rates



Unit Rates

Tab and Crystal both own cats.

- Tab buys a 3-pound bag of cat food every 30 days. At what rate does his cat eat the food?
- Crystal buys a 5-pound bag of cat food every 45 days. At what rate does her cat eat the food?
- Whose cat, Tab's or Crystal's, eats more food per day?

Lesson 2.3 • Proportions and Measurement Systems

Name _____ Period _____ Date _____

1. Find the value of n in each proportion.

a. $\frac{2.54 \text{ centimeters}}{1 \text{ inch}} = \frac{n \text{ centimeters}}{12 \text{ inches}}$

b. $\frac{1 \text{ kilometer}}{0.621 \text{ mile}} = \frac{n \text{ kilometers}}{200 \text{ miles}}$

c. $\frac{1 \text{ yard}}{0.914 \text{ meter}} = \frac{140 \text{ yards}}{n \text{ meters}}$

d. $\frac{0.305 \text{ meter}}{1 \text{ foot}} = \frac{200 \text{ meters}}{n \text{ feet}}$

2. Use the conversion factors in the table to make each conversion.

a. 10 inches to centimeters

b. 355.6 centimeters to inches

c. 7392 feet to miles

d. 1 mile to inches

e. 4 miles to meters

f. 100 yards to meters

1 inch = 2.54 centimeters
1 foot \approx 0.305 meter
1 foot = 12 inches
5,280 feet = 1 mile
1 yard = 3 feet

3. Write a proportion and answer each question below using the conversion factor 1 kilogram \approx 2.2 pounds.

- a. \$20 buys 2.5 kilograms of steak. How many pounds of steak will \$20 buy?

3. Write a proportion and answer each question below using the conversion factor $1 \text{ kilogram} \approx 2.2 \text{ pounds}$.
- a. \$20 buys 2.5 kilograms of steak. How many pounds of steak will \$20 buy?
 - b. Mr. Ruan weighs 170 pounds. What is his mass in kilograms?
 - c. Which is heavier, 51 kilograms or 110 pounds?
 - d. Professional middleweight boxers have a weight of at most 160 pounds, which is a mass of at most _____ kilograms.
4. Olympic track and field records are kept in metric units. Use the conversion factors for Exercises 2 and 3 to answer each question below. (*Encyclopedia Britannica Almanac 2005*, pp. 919–923.)
- a. In 2004, Veronica Campbell of Jamaica won the 200-meter run in 22.05 seconds. Her average speed was _____ meters per second, or _____ feet per second. Round answers to the nearest hundredth.

- b. In 2004, Christian Olsson of Sweden won the triple jump with a distance of 17.79 meters. How many inches was his jump? Give the answer to the nearest inch.
- c. In 2004, Yuriy Bilonog of Ukraine won the 16-pound shot put with a distance of 21.16 meters. How far is this in yards? What was the mass of the shot in kilograms? Round answers to the nearest hundredth.
- d. In 2004, Huina Xing of China won the women's 10-kilometer run in a time of 30 minutes 24.36 seconds. How far, to the nearest hundredth, did she run in miles? Note: $1 \text{ kilometer} = 1000 \text{ meters}$.
- e. In 2004, Stefano Baldini of Italy won the marathon (26 miles 385 yards) in 2 hours 10 minutes 55.0 seconds. How far is the marathon in meters? What was his average speed in meters per minute? Round answers to the nearest tenth.

Out:

Make up a dimensional analysis problem.

Finish the worksheet from class!

Summary:

What I need to remember about dimensional analysis is...